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Search for Higgsino pair production in pp collisions at root s=13 TeV in final states with large missing transverse momentum and two Higgs bosons decaying via H -> b(b)over bar

By: [Sirunyan, AM](#) (Sirunyan, A. M.)^[1]; [Tumasyan, A](#) (Tumasyan, A.)^[1]; [Adam, W](#) (Adam, W.)^[2]; [Ambrogio, F](#) (Ambrogio, F.)^[2]; [Asilar, E](#) (Asilar, E.)^[2]; [Bergauer, T](#) (Bergauer, T.)^[2]; [Brandstetter, J](#) (Brandstetter, J.)^[2]; [Brondolin, E](#) (Brondolin, E.)^[2]; [Dragicevic, M](#) (Dragicevic, M.)^[2]; [Ero, J](#) (Ero, J.)^[2] ...More

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Abstract

Results are reported from a search for new physics in 13 TeV proton-proton collisions in the final state with large missing transverse momentum and two Higgs bosons decaying via H -> b(b)over bar. The search uses a data sample accumulated by the CMS experiment at the LHC in 2016, corresponding to an integrated luminosity of 35.9 fb⁻¹. The search is motivated by models based on gauge-mediated supersymmetry breaking, which predict the electroweak production of a pair of Higgsinos, each of which can decay via a cascade process to a Higgs boson and an undetected lightest supersymmetric particle. The observed event yields in the signal regions are consistent with the standard model background expectation obtained from control regions in data. Higgsinos in the mass range 230-770 GeV are excluded at 95% confidence level in the context of a simplified model for the production and decay of approximately degenerate Higgsinos.

Keywords

KeyWords Plus: ATLAS DETECTOR; SUPERGAUGE TRANSFORMATIONS; SUPERSYMMETRY; MODEL; PARTICLE; MASS; LHC; NATURALNESS; RESUMMATION; INVARIANT

Author Information

Reprint Address: Sirunyan, AM (reprint author)

+ Yerevan Phys Inst, Yerevan, Armenia.

Addresses:

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- [2] Inst Hochenergiephys, Vienna, Austria
- [3] Inst Nucl Problems, Minsk, BELARUS
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